

REMARKS

Claims 1-2 and 4 are pending in the present application. Claim 4 is withdrawn from consideration by the Examiner. Claims 1 and 4 are herein amended. No new matter has been presented.

Rejections under 35 USC §103(a)

Claims 1-2 were rejected under 35 USC §103(a) as being obvious over Sagawa et al. (U.S. Patent No. 5,194,098) and further in view of Nomura et al. (US 2004/0094237).

In the amendment, claim 1 has been amended for clarification to recite that the R-Fe-B based alloy is “deposited by a physical film forming method.”

The Examiner alleged as follows:

As to Claim 1, US Sagawa et al. US 5,194,098 discloses in the 5th embodiment a rare earth **film** Fe-B-R where R is 8-30 percent, and consisting of Yttrium (a rare earth lanthanide element), Fe and B in which the crystals are present (Col. 3, Line 19-26).

The film alloys are amorphous in nature (composite texture) and discloses that the process of making includes a sintering process to produce any desired shape and size (Col. 5, Line 39-46). Sagawa discloses that the crystal grain sizes range from 2 to 40 microns and increase the Hc of various materials based on their critical size and would overlap applicants range (Col. 6, Line 41-46). Nevertheless, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made, since it has been held that choosing the overlapping portion, of the range taught in the prior art and the range claimed by the applicant, has been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549.

With regard to the thickness range, the Examiner deems that it would have been obvious to optimize the thickness of the final alloy depending on the desired end use, especially given the size ranges of the particulate

and the fact that the powder can be compressed and sintered into any desired shape and size (Col. 5, Line 39-46 and Examples).

Sagawa et al. US 5,194,098 does not disclose R₂Fe₁₄B crystals. However, Nomura et al. US 200410094237 discloses that R-Fe-B magnets are structured with a hard magnetic phase of R₂Fe₁₄B is present as the primary phase and grain boundary moieties surround the primary phase grains (Paragraph 5). The R₂Fe₁₄B phase would necessarily/inherently be present in the Sagawa invention.

(Office Action, page 2, last 6 lines to page 3, line 16). However, claim 1 does not simply claim R-Fe-B alloy in which crystals are present, as the Examiner alleges, but it recites, among other things, “which is **deposited by a physical film forming method**, wherein the alloy film has a **thickness is 0.2 to 400μm**, and wherein the R-Fe-B based alloy has a **composite texture** comprising **R₂Fe₁₄B crystals grown by heat treatment** of said alloy film and having a crystal **grain diameter of 3 to 30 μm** and **R-element-rich grain boundary phases** formed by the heat treatment present at boundaries between the crystals, and having a nucleation type coercive force.” Thus, the Examiner fails to address these recitations of the claim.

Sagawa et al. describes at a cited portion as follows:

The fifth embodiment thereof provides a **sintered** anisotropic permanent magnet having a major phase formed of an intermetallic compound(s) of the Fe-B-R type having a crystal structure of the substantially tetragonal system, and consisting essentially of, by atomic percent 8-30% R (at least one of rare earth elements inclusive of Y), 2-28% B and the balance being Fe with impurities.

(Sagawa et al., column 3, lines 19-26). Here, Sagawa et al. discusses **sintered** magnet but not a film despite the Examiner’s allegation. Thin film magnets and sintered magnets are different materials in their history of the development and in their material-scientific properties. (See

partial translation of OKUDA et al. Journal of Japanese Applied Magnetics Association, Vol. 27, No. 10, pp. 6859-6864 (2003).

This can be further confirmed by the description of Sagawa et al. in “BACKGROUND OF THE INVENTION”: “However, these materials are all obtained by sputtering in the form of thin films that cannot be generally used as magnets for, e.g., speakers or motors.” (Col. 1, Line 59-62); “These melt-quenched ribbons or sputtered thin films are not any practical permanent magnets (bodies) that can be used as such.” (Col. 2, Line 9-11), and the description in “SUMMARY OF THE DISCLOSURE”: “still further object of the present invention is to provide magnetic materials and permanent magnets which can be formed into any desired shape and size” (Col. 2, Line 42-44).

Thus, Sagawa et al. discloses “practical permanent magnets (bodies)” which was not obtained from melt-quenched ribbons or sputtered thin films. The sintered alloy and alloy deposited through a physical film forming method is structurally distinguishable.

Sagawa et al. describes at another cited portion as follows:

The permanent magnets according to the present invention are prepared by a so-called **powder metallurgical process**, i.e., sintering, and can be formed into any desired shape and size, as already mentioned. However, desired practical permanent magnets (bodies) were not obtained by such a **melt-quenching process** as applied in the preparation of **amorphous thin film alloys**, resulting in no practical coercive force at all.

(Sagawa et al., column 5, lines 39-46). Here, Sagawa et al. discusses amorphous thin film alloys obtained by a melt-quenching process.

Although the Examiner alleged that “it would have been obvious to optimize the thickness of the final alloy depending on the desired end use, especially given the size ranges of the particulate and the fact that the powder can be compressed and sintered into any desired shape and size,” an alloy film having a thickness of 0.2 to 400 μ m will not be manufactured even by recent state of the art technology of powder metallurgical process. The reasons are as follows: (1) powders are not compressed evenly being distributed throughout the thin green body; (2) such a thin green body will not be easily taken out from the compression forming machine because of its poor strength; (3) necessary Nd-rich phase will not be easily obtained because great portion of Nd will be lost during the sintering; (4) a uniform thin film will not be obtained because the compression-formed thin film body will deform during sintering because of uneven sintering contraction.

Thus, it is clear for a person having ordinary skill in the art that “compressed and sintered into any desired shape and size” in Sagawa et al. is not meant to cover thin film.

Thus, Sagawa et al. does not teach or suggest “an R-Fe-B based alloy which is deposited by a physical film forming method into an alloy film, wherein the alloy film has a thickness is 0.2 to 400 μ m,” and “wherein the R-Fe-B based alloy has a composite texture comprising $R_2Fe_{14}B$ crystals grown by heat treatment of said alloy film and having a crystal grain diameter of 3 to 30 μ m and R-element-rich grain boundary phases formed by the heat treatment present at boundaries between the crystals, and having a nucleation type coercive force.”

For at least these reasons, claim 1 patentably distinguishes over Sagawa et al. Claim 2, depending from claim 1, also patentably distinguishes over Sagawa et al. for at least the same reasons.

Withdrawn Claim

Claim 4 has been amended further incorporate recitations to obtain the R-Fe-B alloy based thin film magnet. Thus, there is a technical relationship between those inventions of claims 1 and 2 involving one or more of the same or corresponding special technical features, which are technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art, as provided in PCT Rule 13.2. Also, claim 4 satisfies the relationship under 37 CFR 1.475 (b) (1).

Thus, claim 4 should be rejoined.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

Application No. 10/593,624
Art Unit: 1794

Amendment under 37 C.F.R. §1.111
Attorney Docket No. 062926

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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